



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|-------------------------|
| 10/814,294 | 04/01/2004 | Paul Thurk | 040897-0114 | 6127 |
| 7590 | 11/09/2005 | | | EXAMINER WON, BUMSUK |
| Stephen B. Maebius Foley & Lardner LLP Washington Harbour 3000 K Street, N.W., Suite 500 Washington, DC 20007-5143 | | | ART UNIT 2879 | PAPER NUMBER |
| DATE MAILED: 11/09/2005 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/814,294 | THURK, PAUL |
| | Examiner Bumsuk Won | Art Unit 2879 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 01 April 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-51 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-51 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 01 April 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/13/2004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION***Drawings***

The drawings are objected to because figures 3-5 are not clear and difficult to read.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: "serial no. _____" on page 18 has number missing. The number is 10/814295. Appropriate correction is required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Light-emitting ceiling tile having semiconductor nanoparticles.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 13, 16, 20-21, 24-27, 31, 41, 47-48, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frecska (US 6,693,512) in view of Fink (US 2003/0057821).

Regarding claim 1, Frecska discloses a light emitting ceiling tile (abstract). However, Frecska does not disclose the light emitting ceiling tile comprising light emitting group IV nanoparticles.

Fink discloses using light emitting group IV nanoparticle in an analogous art, for the purpose of emitting different light wavelengths (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light emitting group IV nanoparticles disclosed by Fink in the light emitting ceiling tile disclosed by Frecka, for the purpose of emitting different light wavelengths.

Regarding claim 2, Fink discloses the group IV nanoparticles are silicon nanoparticles (abstract). The reason for combining is the same as for claim 1 above.

Regarding claim 3, Frecka discloses the ceiling tile comprises a ceiling tile substrate (figure 2, 22) and a light emitting subassembly (figure 2, 100, specifically 110) disposed on the substrate (22). However, Frecka does not disclose the subassembly comprising the group IV nanoparticles.

Fink discloses a subassembly comprising the group IV nanoparticles in an analogous art. The reason for combining is the same as for claim 1 above.

Regarding claim 4, Frecka discloses the ceiling tile substrate (figure 2, 22) comprises two opposing flat faces (23 and 24) and a perimeter (vertical line), and the light-emitting subassembly (100, specifically 110) comprises two opposing flat faces (top and bottom of 110) and a perimeter (vertical line).

Regarding claim 5, Fink discloses the light-emitting subassembly (figure 1) comprises a light-emitting layer (104-109), wherein the layer comprises the group IV nanoparticles (abstract).

The reason for combining is the same as for claim 1 above.

Regarding claim 6, Fink discloses the light-emitting layer comprises a binder for the light-emitting group IV nanoparticles (paragraph 21).

The reason for combining is the same as for claim 1 above.

Regarding claim 13, Frecka discloses a light emitting ceiling tile comprising a ceiling tile substrate (figure 2, 22) and a light emitting subassembly (100, specifically 110) disposed on the substrate (22), the subassembly (100, specifically 110), wherein the ceiling tile substrate (22) comprises two opposing flat faces (23 and 24) and a perimeter (vertical line), and the light emitting subassembly (100, specifically 110) comprises two opposing flat faces (top and bottom of 110) and a perimeter (vertical line). However, Frecka does not disclose the subassembly comprising light emitting group IV nanostructures.

Fink discloses a subassembly in an analogous art comprising light emitting group IV nanostructures (abstract). The reason for combining is the same as for claim 1 above.

Regarding claim 16, Fink discloses a light emitting device is adapted to provide contact with a voltage source (paragraph 24 and figure 2). The reason for combining is the same as for claim 1 above.

Regarding claim 20, Frecka discloses a subassembly for use in a light emitting ceiling tile (figure 2). However, Frecka does not disclose the subassembly comprising light emitting group IV nanoparticle.

Fink discloses the subassembly comprising light emitting group IV nanoparticle.

The reason for combining is the same as for claim 1 above.

Regarding claim 21, Fink discloses the group IV nanoparticles are group IV silicon nanoparticles (abstract). The reason for combining is the same as for claim 1 above.

Regarding claim 24, Frecska discloses the subassembly (figure 2, 110) is adapted to be disposed on a ceiling tile substrate (22).

Regarding claim 25, Frecska discloses the subassembly comprises two opposing faces (figure 2, 110, top and bottom) and a perimeter edge (vertical line).

Regarding claim 26, Fink discloses the light emitting subassembly comprises a light emitting layer (figure 104-109), wherein the layer comprises the group IV nanoparticles (abstract). The reason for combining is the same as for claim 1 above.

Regarding claim 27, Fink discloses the subassembly comprises a binder for the group IV nanoparticles (paragraph 21). The reason for combining is the same as for claim 1 above.

Regarding claim 31, Fink discloses the subassembly emits colored light (abstract).

The reason for combining is the same as for claim 1 above.

Art Unit: 2879

Regarding claim 41, Frecska discloses the method of making (abstract) a light emitting ceiling tile (figure 2) comprising combining a ceiling tile substrate (22) with a light emitting subassembly (110) that the subassembly is disposed on the ceiling tile substrate (22). However, Frecska does not disclose the light emitting subassembly comprising light emitting group IV nanoparticles.

Fink discloses a light emitting subassembly comprising light emitting group IV nanoparticles (abstract). The reason for combining is the same as for claim 1 above.

Regarding claim 47, Frecska discloses a light emitting tile (figure 2) comprising a tile substrate (22) and a light emitting subassembly (110) disposed on the substrate (22), wherein the tile substrate (22) comprises two opposing flat faces (23 and 24) and a perimeter (vertical lines), and the light emitting subassembly (110) comprises two opposing flat faces (top and bottom of 110) and a perimeter (vertical lines). However, Frecska does not disclose the subassembly comprising light emitting group IV nanostructures.

Fink discloses a light emitting assembly with a layer (figure 1, 104-109) comprising light emitting group IV nanostructures (abstract). The reason for combining is the same as for claim 1 above.

Regarding claim 48, Fink discloses the nanostructures are nanoparticles (abstract).

The reason for combining is the same as for claim 1 above.

Regarding claim 51, Fink discloses the light emitting device is adapted to provide contact with a voltage source (paragraph 24, figure 2). The reason for combining is the same as for claim 1 above.

Claims 7-9, 14-15, 17-19, 28-29, 32-39 and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frecka (US 6,693,512) in view of Fink (US 2003/0057821), in further view of Angelopoulos (US 2002/0025391).

Regarding claim 7, Frecka in view of Fink discloses all of the claimed limitations except for the light-emitting subassembly comprises a first electrical insulation layer, a first electrode layer, a light-emitting layer, a second electrode, and a second electrical insulation layer.

Angelopoulos discloses a light-emitting subassembly (figure 3) in an analogous art comprises a first electrical insulation layer (top glass), a first electrode layer (top transparent electrode), a light-emitting layer (liquid crystal), a second electrode (bottom transparent electrode), and a second electrical insulation layer (bottom glass), for the purpose of emitting light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a light-emitting subassembly comprises a first electrical insulation layer, a first electrode layer, a light-emitting layer, a second electrode, and a second electrical insulation layer disclosed by Angelopoulos in the light emitting ceiling tile disclosed by Frecka in view of Fink, for the purpose of emitting light.

Art Unit: 2879

Regarding claim 8, Frecka in view of Fink discloses all of the claimed limitations except for the light-emitting subassembly comprises a first electrical insulation layer, upon which is disposed a first electrode layer, upon which is disposed a light-emitting layer, upon which is disposed a second electrode, upon which is disposed a second electrical insulation layer.

Angelopoulos discloses a light-emitting subassembly (figure 3) in an analogous art comprises a first electrical insulation layer (top glass), upon which is disposed a first electrode layer (top transparent electrode), upon which is disposed a light-emitting layer (liquid crystal), upon which is disposed a second electrode (bottom transparent electrode), upon which is disposed a second electrical insulation layer (bottom glass).

The reason for combining is the same as for claim 7 above.

Regarding claim 9, Angelopoulos discloses the first electrical insulation layer (figure 3, top glass) and the first electrode layer (top transparent electrode) are substantially transparent to the light emitted by the light-emitting layer (liquid crystal).

The reason for combining is the same as for claim 7 above.

Regarding claim 14, Frecka in view of Fink discloses all of the claimed limitations except for the light-emitting subassembly comprises a first electrical insulation layer, upon which is disposed a first electrode layer, upon which is disposed a light-emitting layer, upon which is disposed a second electrode, upon which is disposed a second electrical insulation layer.

Angelopoulos discloses the light-emitting subassembly (figure 3) comprises a first electrical insulation layer (top glass), upon which is disposed a first electrode layer (top

Art Unit: 2879

transparent electrode), upon which is disposed a light-emitting layer (liquid crystal), upon which is disposed a second electrode (bottom transparent electrode), upon which is disposed a second electrical insulation layer (bottom glass). The reason for combining is the same as for claim 7 above.

Regarding claim 15, Angelopoulos discloses the first electrical insulation layer (top glass) and the first electrode layer (top transparent electrode) are transparent to the light emitted by the light emitting layer (liquid crystal). The reason for combining is the same as for claim 7 above.

Regarding claim 17, Angelopoulos discloses the light-emitting subassembly (figure 3) comprises a first electrical insulation layer (top glass), a first electrode layer (top transparent electrode), a light-emitting layer (liquid crystal), a second electrode (bottom transparent electrode), and a second electrical insulation layer (bottom glass).

The reason for combining is the same as for claim 7 above.

Regarding claim 18, Angelopoulos discloses the light emitting device further comprising a reflective layer (claim 31). The reason for combining is the same as for claim 7 above.

Regarding claim 19, Angelopoulos discloses the light emitting device further comprising an electron transport layer and a hole transport layer (paragraph 191).

The reason for combining is the same as for claim 7 above.

Regarding claim 28, Frecska in view of Fink discloses all of the claimed limitations except for the light-emitting subassembly comprises a first electrical insulation layer, upon which is disposed a first electrode layer, upon which is disposed a light-emitting layer, upon which is disposed a second electrode, upon which is disposed a second electrical insulation layer.

Angelopoulos discloses a light-emitting subassembly (figure 3) in an analogous art comprises a first electrical insulation layer (top glass), upon which is disposed a first electrode layer (top transparent electrode), upon which is disposed a light-emitting layer (liquid crystal), upon which is disposed a second electrode (bottom transparent electrode), upon which is disposed a second electrical insulation layer (bottom glass).

The reason for combining is the same as for claim 7 above.

Regarding claim 29, Angelopoulos discloses the first electrical insulation layer (figure 3, top glass) and the first electrode layer (top transparent electrode) are substantially transparent to the light emitted by the light-emitting layer (liquid crystal).

The reason for combining is the same as for claim 7 above.

Regarding claim 32, Frescka discloses a subassembly (figure 2, 22) for use in a light emitting ceiling tile (figure 2), where in the subassembly comprises two opposing faces (23 and 24) and a perimeter edge (vertical line).

Frescka does not disclose first electrical insulation layer, a first electrode layer, a light-emitting layer which comprises light emitting group IV nanostructures, a second electrode, and a second electrical insulation layer.

Art Unit: 2879

Fink discloses a light emitting layer (figure 1, 104-109) comprises light emitting group IV nanostructures (abstract), for the purpose of emitting different light wavelengths.

Angelopoulos discloses a light-emitting subassembly (figure 3) in an analogous art comprises a first electrical insulation layer (top glass), a first electrode layer (top transparent electrode), a light-emitting layer (liquid crystal), a second electrode (bottom transparent electrode), and a second electrical insulation layer (bottom glass), where in the first electrode layer (top transparent electrode) is transparent to the light emitted by the light emitting layer (liquid crystal), for the purpose of emitting light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a light-emitting subassembly comprises a first electrical insulation layer, a first electrode layer, a light-emitting layer, a second electrode, and a second electrical insulation layer disclosed by Angelopoulos and a light emitting layer comprising light emitting group IV nanostructures disclosed by Fink in the light emitting ceiling tile disclosed by Frecka, for the purpose of emitting different light wavelengths.

Regarding claim 33, Fink discloses the subassembly is adapted to provide contact with a voltage source (paragraph 24 and figure 2). The reason for combining is the same as for claim 32 above.

Regarding claim 34, Fink discloses the nanostructure are nanoparticles (abstract).

The reason for combining is the same as for claim 32 above.

Regarding claim 35, Angelopoulos discloses the subassembly further comprising a reflective layer (claim 31). The reason for combining is the same as for claim 32 above.

Regarding claim 36, Angelopoulos discloses the subassembly further comprising an electron transport layer and a hole transport layer (paragraph 191).

The reason for combining is the same as for claim 32 above.

Regarding claim 37, Angelopoulos discloses the subassembly further comprising a reflective layer (claim 31). The reason for combining is the same as for claim 32 above.

Regarding claim 38, Angelopoulos discloses the subassembly further comprising an electron transport layer and a hole transport layer (paragraph 191).

The reason for combining is the same as for claim 32 above.

Regarding claim 39, Angelopoulos discloses the subassembly further comprising an electron transport layer and a hole transport layer (paragraph 191).

The reason for combining is the same as for claim 32 above.

Regarding claim 49, Frecka in view of Fink discloses all of the claimed limitations except for the light emitting subassembly comprises a first electrical insulation layer, a first electrode layer, a second electrode, and a second electrical insulation layer.

Angelopoulos discloses a light emitting subassembly (figure 3) comprises a first electrical insulation layer, a first electrode layer, a second electrode, and a second electrical insulation layer. The reason for combining is the same as for claim 32 above.

Regarding claim 50, Angelopoulos discloses the first electrical insulation layer and the first electrode layers are transparent to the light emitted by the light emitting layer (figure 3).

The reason for combining is the same as for claim 32 above.

Claims 10, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frecska (US 6,693,512) in view of Fink (US 2003/0057821), in further view of Srivastava (US 2003/0067265).

Regarding claim 10, Frecska in view of Fink discloses all of the claimed limitations except for the tile emits white light.

Srivasta discloses a light emitting device emits white light (abstract), for the purpose of emitting white light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a light emitting device emits white light disclosed by Srivastava in the light emitting ceiling tile disclosed by Frecska in view of Fink, for the purpose of emitting white light.

Regarding claim 30, Frecska in view of Fink discloses all of the claimed limitations except for the tile emits white light.

Srivasta discloses a light emitting device emits white light (abstract), for the purpose of emitting white light. The reason for combining is the same as for claim 10 above.

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frecska (US 6,693,512) in view of Fink (US 2003/0057821), in further view of Hosokawa (US 2001/0009351).

Regarding claim 11, Frecska in view of Fink discloses all of the claimed limitations except for the light emitting subassembly comprises an electron barrier layer.

Hosokawa discloses a light emitting subassembly comprises an electron barrier layer (paragraph 129), for the purpose of improving recombination efficiency (paragraph 129).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have an electron barrier layer in a light emitting subassembly disclosed by Hosokawa in the light emitting tile disclosed by Frecska in view of Fink, for the purpose of improving recombination efficiency.

Regarding claim 12, Frecska in view of Fink discloses all of the claimed limitations except for the light emitting subassembly comprises an hole barrier layer.

Hosokawa discloses a light emitting subassembly comprises an hole barrier layer (paragraph 129), for the purpose of improving recombination efficiency (paragraph 129).

The reason for combining is the same as for claim 11 above.

Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frecska (US 6,693,512) in view of Fink (US 2003/0057821), in further view of Lee (2004/0036130).

Regarding claim 22, Frecska in view of Fink discloses all of the claimed limitations except for the group IV nanoparticles are core-shell nanoparticles.

Lee discloses the group IV nanoparticles are core-shell nanoparticles in an analogous art (paragraphs 77-78), for the purpose of emitting light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the group IV nanoparticles are core-shell nanoparticles disclosed by Lee in the light emitting subassembly disclosed by Frecska in view of Fink, for the purpose of emitting light.

Regarding claim 23, Fink discloses the group IV nanoparticles comprising silicon (abstract).

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frecska (US 6,693,512) in view of Lee (2004/0036130), in further view of Angelopoulos (US 2002/0025391).

Regarding claim 40, Frecka discloses a light emitting ceiling device (figure 2).

However, Frecka does not disclose the light emitting ceiling device comprising a plurality of nanoparticles, a first electrode, and a second electrode.

Lee discloses a plurality of nanoparticle in an analogous art, the nanoparticles comprising a group IV semiconductor (abstract) and a capping agent (paragraph 244) coupled to the group IV semiconductor, wherein the nanoparticles have an average diameter of between 0.5 nm to 15 nm (paragraph 39), for the purpose of emitting different light wavelengths.

Angelopoulos discloses a light emitting device (figure 3) comprising a first electrode (top transparent electrode) electrically coupled (abstract) to the plurality of light emitting layer (liquid crystal), and a second electrode (bottom transparent electrode) electrically coupled (abstract) to the light emitting layer (liquid crystal), wherein the first and second electrodes (transparent electrodes) together are configured to conduct an applied current to the light emitting layer, wherein the light emitting layer produce light in response to the applied current (paragraph 188 describes it is necessary to have current going through the light emitting layer in order to produce light), for the purpose of emitting light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a nanoparticles comprising a group IV semiconductor and a capping agent coupled to the group IV semiconductor, wherein the nanoparticles have an average diameter of between 0.5 nm to 15 nm disclosed by Lee and a first electrode electrically coupled to the plurality of light emitting layer, and a second electrode electrically coupled to the light emitting layer, wherein the first and second electrodes together are configured to conduct an applied current to the light emitting layer, wherein the light emitting layer produce light in response to

the applied current disclosed by Angelopoulos in the light emitting ceiling tile device disclosed by Frecska, for the purpose of emitting different light wavelengths.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Angelopoulos (US 2002/0025391) in view of Fink (US 2003/0057821).

Regarding claim 42, Angelopoulos discloses the method of making a light emitting subassembly (figure 3) comprising combining (a) a light emitting layer (liquid crystal), (b) first and second electrode layers (two transparent electrodes), and (c) first and second electrical insulation layers (both top and bottom glasses), wherein the layers (a), (b), and (c) are in laminar arrangement (figure 3), wherein the first electrode is disposed on the first electrical insulation layer, and the first electrode and the first electrical insulation layer are transparent (figure 3). However, Angelopoulos does not disclose the light emitting layer comprising light emitting group IV nanoparticles.

Fink discloses a light emitting layer comprising light emitting group IV nanoparticles (abstract), for the purpose of emitting different light wavelengths (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a light emitting layer comprising light emitting group IV nanoparticles disclosed by Fink in the method of making a light emitting subassembly disclosed by Angelopoulos, for the purpose of emitting different light wavelengths.

Claims 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frecska (US 6,693,512) in view of Fink (US 2003/0057821), in further view of Ilenda (6,526,213).

Regarding claim 43, Frecska in view of Fink discloses all of the claimed limitations except for using the ceiling tile for emergency lighting. Ilenda discloses using lighting source for emergency lighting (column 9, lines 17-48), for the purpose of having lighting in an emergency.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the light source for emergency lighting disclosed by Ilenda in the ceiling tile disclosed by Frecska in view of Fink, for the purpose of having lighting in an emergency.

Regarding claim 44, Ilenda discloses using lighting source for in-door lighting (column 9, lines 17-48). The reason for combining is the same as for claim 43 above.

Regarding claim 45, Ilenda discloses using lighting source for track lighting (column 9, lines 17-48). The reason for combining is the same as for claim 43 above.

Regarding claim 46, Ilenda discloses using lighting source for direct lighting of an airplane interior (column 9, lines 17-48). The reason for combining is the same as for claim 43 above.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bumsuk Won whose telephone number is 571-272-2713. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Bumsuk Won
Patent Examiner



JOSEPH WILLIAMS
PRIMARY EXAMINER